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AMERICAN DYESTUFF REPORTER

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In 2 Sections
Section 1

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AMERICAN DYESTUFF REPORTER

A Weekly Publication devoted to

DYESTUFFS, COLORS and ALLIED CHEMICALS

"Circulated Everywhere Dyestuffs Are Used"

In Two Sections—Section One

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CHEMICAL DISARMAMENT

Being Extracts from the Recent Article

By V. Lefebure

THAT those engaged in considering legislation for the protection of the dye industry, whether in this country or in any other, must realize that they are legislating not on a matter of merely commercial significance, but on world peace, is one of the strong arguments against continued Senatorial indifference advanced by V. Lefebure, formerly British liaison officer with the French forces, in an intensely interesting article in a recent issue of *Chemical & Metallurgical Engineering* under the above heading. It is impossible to bring about international disarmament, he shows, while any country retains a monopoly of the dye industry, and in his logical proof that the German dye industry has been strengthened instead of weakened by the war there should be much food for thought on the part of those who have made it a practice on every possible occasion to bawl deafeningly that our dye makers have nothing to fear from that source.

Although a part of Mr. Lefebure's subject matter will be familiar to our readers, his way of presenting it provides a somewhat new "slant," so to speak, and will be perused with interest. And there is a distinctly new thought in his significant proposal that, if the worst should come to the worst, the Allies would be amply justified by the Treaty of Versailles in greatly curtailing that part of the German dye industry which produced poison gases during the war, and, under another clause of that contentious instrument, in actually seizing and closing up some of the Rhine dye works.

Here's an idea indeed! Man usually finds some way of pulling down to his own level those things which he cannot jump high enough to reach; and while the Allies and the United States are engaged in trying to attain the efficiency of the German dye-explosive-gas industry, they may possibly find it expedient to destroy a part of it in order that the world's

total chemical armament may not be too strongly centered. The only trouble is that unless Congress manifests greater concern for its duties than it has in the past two years, this country may be the only one acutely desiring such limitation of Rhine valley activities, since the others have wisely protected themselves in the matter of chemical armament.

The legal authority of the Allies to make such a demand, the writer declares, depends upon the proper interpretation of the term. This should not be difficult in any country save this. However, we will let Mr. Lefebure continue the discussion in his own words:

"The League of Nations has instituted a definite commission to consider the question of world disarmament. A brief analysis reveals the fact that disarmament must cover three essential factors in warfare—the combatants, mechanical types of armament, and war-chemicals.

"Chemical armament, very generally, represents the actual death-dealing constituents of projectiles. This must, however, be qualified by the statement that the new type of chemical armament has become in some cases, and may increasingly become, independent of any special projectile. This is a most important item from the point of view of disarmament. It means that the limitation of projectiles may not carry with it limitation of the chemical weapon.

"How do normal disarmament schemes apply to the chemical type? This type of weapon covers, roughly, two classes—explosives and the so-called poison gases. They have one common characteristic. This is their peace-time use. This refuses to any disarmament scheme the right to disarm in the simplest fashion—that is, by the total destruction of producing capacity. The world must have for normal development a large producing capacity for explosives and for the other types of chemical armament. Germany produced practically every ounce of her hundreds of thousands of tons of poison gas in dye plants. The infinitely flexible, almost instantaneously converted dye plants are a logical means of production of all organic chemical weapons, including explosives.

"We must now stop to lay emphasis on a general principle. There are two methods of disarmament. In the first class you can disarm very simply by destroying all the means of production and preventing their renewed growth. In the second class, because the means of production—the factories—have a peace-time function, you cannot disarm by destruction. How, then, can you disarm in this case?

"There is only one way—it is to insure that no one country possesses a monopoly in the means of production. The brightest and most telling war-chemical invention has no value for and no incidence upon warfare unless it can be produced rapidly and in quantity. Production is the key to its war use. Let us examine very briefly, therefore, the world distribution of the means of production for this new type of weapon. Before the war Germany held the almost absolute monopoly of world organic-chemical production. Through this monopoly she launched the poison-gas campaign, and for more than two years the Allied reply was relatively feeble. This was not due to Allied lack of invention, but to lack of producing capacity.

"During the war, however, for economic rather than military reasons, dye-producing industries sprang up in France, America and England. Their development was relatively feeble, owing to numerous obvious reasons. From the point of view of our argument this development left the world in the following situation regarding organic chemical-producing capacity:

"The German dye industry, the source of her war-chemical production, was considerably strengthened. Other countries were left with promising but relatively feeble organic

chemical resources which could not immediately, even under normal commercial conditions, hope to break the German monopoly. In other words, although for most types of armament the pre-war balance in favor of Germany was decreased, yet for this one type of chemical armament the German monoply was strengthened."

We are, therefore, declares Mr. Lefebure, left in face of the following situation: For most types of armament the war has led to a redistribution of producing capacity in the direction of an equilibrium. By diminishing this capacity and controlling and inspecting we may obtain international disarmament; but in chemical warfare, the final situation is just as remote from equilibrium as before. The conclusion is obvious. The world must have organic chemical-producing capacity, but it cannot tolerate a monopoly held by those who so drastically abused its possession. There must be a redistribution before we can claim to have even approached disarmament. It would be farcical to proceed with general disarmament schemes and to leave this untouched. In other words, we must break the German monopoly. He continues:

"How can this be achieved? There are two main avenues of approach. The new-born dye industries of France, America and England, and, if you wish, other countries, must be supported nationally through legislation and internationally through some such organization as the League of Nations.

"In America and England legislation designed to protect the dye industry is before both countries. The issue is likely to be fought out on purely national grounds. This alone is entirely unsatisfactory. It must be realized by all concerned that they are legislating on a matter which has infinitely more than com-

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mercial significance. They are legislating on world peace.

"Chemical disarmament is a matter which, unfortunately, non-technical people do not fully understand. They think it sufficient to issue an edict against the use of poison gas, not realizing that this alone is absolutely futile as an effective measure. You cannot prevent any discoveries in chemical warfare, because, unlike the development of mechanical invention, such chemical discoveries can occur, when directed by a trained mind, with the mere use of a few pots, pans, beakers, in any unguarded and unsuspected locality. The redistribution of producing capacity is therefore critical.

"Article 168 of the Treaty of Versailles provides for the restriction by the Allied and Associated Powers of the manufacture of war material and of the approval of those Powers for the continued existence of factories and works for such production in Germany. On these grounds it is logically possible to limit seriously that capacity of the German dye industry which produced poison gases during the war and may continue to do so. Article 169 provides for the surrender to the Allied and Associated Powers of any special plant intended for the manufacture of military material, except such as may be recognized as necessary for equipping the authorized strength of the German Army. The execution of this clause, if a proper interpretation of chemical armament be used, would imply the closing down of many of the German dye plants which produced those huge quantities of poison gases during the war.

"We repeat that the crux of all disarmament is the redistribution of organic chemical capacity throughout the world. This is, without any doubt, one of the most important measures now before the world, and, in addition, one of the few measures with regard to which immediate action can be taken toward the stabilization of world peace."

NOTES ON DYEING UNION MATERIAL

(Concluded from last week.)

Dyestuffs to Use

When the boiling point has been reached and it is found that the silk is dyed heavier than the wool the boiling must be continued in order to bring the wool to the same shade. It is a difficult matter to give a list of the dyestuffs that will produce the various shades, as most of the shades and colors most in vogue to-day are blends of several dyestuffs. For this reason I am going to mention only a few of the dyes suitable for combination work rather than to confine the discussion to any given shades.

Following are some of the acid colors suitable for this kind of work: Milling Yellow, Tartrazine, Azo Yellow, Indigotine, Patent Blue, Sulphon Cyanine, Acid Navy Blue, Fast Acid Green, Wool Green A, Ponceau Scarlet, Acid Red BP, Acid Crimson GA, Acid Orange, Orange 4, Acid Violet 6B, Acid Violet 4BC, Acid Violet 10B.

The Dyeing Process

The acid dyes are very often used for this kind of work and are, as a rule, as fast as the acid colors and, in many cases, faster. Union colors are also used to a considerable extent, but as these are composed mostly of direct colors, with enough neutral dyeing wool color to produce a solid shade, they can be considered in the same class as the direct dyes. When union or direct dyes are used to dye wool and silk goods the dyeing is carried on in the same manner as ordinary union dyeing. The process is started at a temperature ranging from 100 to 120 deg. Fahr., the temperature is raised slowly to the boil, and the boiling is continued until the wool is of the desired shade. The steam is then turned off and the material is allowed to remain in the cooling bath for from thirty to forty-five minutes. Most all of the union colors work well on this class of goods and the shades produced are much bloomier than when the goods undergoing treatment are composed of cotton and wool.

Union Blue GS, Union Seal Brown CD, Union Green B, Union Green G, Union Bordeaux OL and Union Fast Red F all possess good leveling properties and have good fastness to light.

Cotton and Artificial Silk

Another class of goods that is quite common to-day is a material made of cotton and artificial silk. This can be dyed with union dyes but it is not necessary to use them, as ordinary direct dyes will answer the purpose and none of the dye is wasted as in the case when union dyes are used. Union dyes, as stated before, contain more or less wool dye and as this has little or no affinity for artificial silk it is not advisable to use this class of dyestuff unless there is no direct dye on hand that will produce the required shade.

Most all of the artificial silk colors work well with the direct colors but I recently had experience with a very peculiar kind of artificial fiber. I tried acid and direct dyes on this silk but neither of them had any affinity for the fiber. I then tried dyeing the silk with basic dyes from a water solution and found that the silk had a little affinity for the dyestuff but not enough to produce a shade with any depth to it. The goods were then immersed in a solution of part water and part alcohol to which the basic dyestuff was added and the material colored very readily. The silk in this particular case was to be used for pompoms on slippers but the party for whom the work was done also informed me that the same kind of silk was to be used for fancy embroidery work as well as mufflers and other articles of wearing apparel. For this reason I deemed it advisable to mention this fact, before taking up other classes of material.

Cotton and Silk

There is a great deal of dress material used for summer wear that is composed of cotton and real silk. Some very good results can be obtained with this class of goods. Two-color effects that are very pleasing to the eye are easily obtained. The material can also be dyed so as to leave one or the other of the fibers uncolored. The following colors have a great affinity for cotton and leave silk unstained or slightly tinted. Direct Fast Yellow A, Direct Blue 2B, Direct Blue BR Conc., Direct Brilliant Blue G, Benzo Azurine, Direct Black BH, Direct Orange G, Direct Orange 5RE, Direct Sky Blue, and Direct Brown BX. The following neutral dyeing wool colors have a good affinity for the silk and leave the cotton unstained or only slightly tinted: Azo Yellow, Metanil Yellow, Acid Orange, Orange 2, Fast Red A, Rocelline, Azo Fuchsine 6B, Acid Violet 6B, Acid Violet 8B, Acid Green M, Wool Green A, Acid Black 10B, Acid Black NBR, and Neutral Wool Blue.

Dyeing Processes

Any of the dyes mentioned above should be dyed in a neutral bath with

(*Continued on page* 12.)

Amanil Colors for Cotton
Union Colors for Mixed Goods
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SENATOR MOSES INTERPRETS

Of solemn and vital interest to the trade is the report of the War Trade Board indicating that during the fiscal year ended June 30, 1920, this country licensed and imported 9,388,296 pounds of dyestuffs from foreign sources, this total including dyes not produced here at all, dyes not produced and for which no satisfactory substitute was produced during that period, and dyes produced here but not available to the consumer on reasonable terms as to price, quality or delivery. The combined figures are imposing.

Switzerland was our heaviest contributor, sending in 3,838,121 pounds. Germany sent us 3,608,262 pounds, almost as much; England contributed 1,625,523 pounds, while from all other sources we obtained 316,390 pounds. The largest single total listed is 1,074,174 pounds of acid colors received from Switzerland during the fiscal year. We drew upon Germany for 1,021,378 pounds of vat colors, on Switzerland for 863,798 pounds and on England for 32,046 pounds of these prime necessities to the textile industries, making a total of 1,917,222 pounds of vat dyestuffs imported under license. Germany sent us 960,250 pounds of acid colors, Switzerland 765,569 pounds of direct cotton colors, and England 462,370 pounds of sulphur colors, this last item representing that country's highest total for any one class.

There were three principal reasons for the granting of licenses; two, of course, being no production here at the time the license was granted, and insufficient production to meet domestic requirements. The third reason interests you because it arises from the failure of dye manufacturers in certain instances to report dyes being produced by them. And upon whom, we are prompted to ask, did the burden fall in cases of that kind—the manufacturer or the consumer? Surely the latter was taken care of, yet there are still some who would have it that the provisions of the Dye bill will prevent the harried consumer from getting what he wants. Incidentally, the manufacturers in question lost sales because of their lack of enterprise, while the consumers were no worse off than they would have been in any event, since—be it whispered!—failure to use even a little advertising space would have obliged the consumers to send abroad, licensing or no licensing.

A correspondent for a contemporary showed the list of imported dyes to Senator George H. Moses, one of the —but you know him! At any rate, the gentleman from New Hampshire eyed it sternly, frowned, shook his head once or twice and cleared his throat before remarking in a manner obviously intended to be highly impressive:

"If this indicates that American dye manufacturers cannot make all of these products, or enough of them at proper prices and terms, the suggested plan of embargoing imports of dyestuffs seems to fall to the ground."

Let coarse, ribald laughter resound from every side! We do not vouch for our description of the Senator's facial expressions just prior to delivering that gem of thought, but our contemporary, which happens to be the *Oil, Paint & Drug Reporter*, does vouch for the remark itself—and the rest is easy to imagine. One is reminded of the small boy on his way to Sunday-school, jingling in his hand two five-cent pieces, one for candy and the other for the collection. Suddenly a coin escaped him, struck the ground and, despite his frantic effort to retrieve it, rolled down into the sewer.

"Oh, gee!" came the exclamation in tones of genuine regret, "ain't that a darn shame; there goes the Lord's nickel!"

Knowing the Senator as intimately as you do by this time, you might easily have predicted his interpretation of the new statistics in advance. Yet can it be possible that he is unaware of the fact that by thus emphasizing the magnitude of the list of colors which the American dye industry could not furnish he is uttering one of the very strongest of all arguments in favor of the Dye bill, which will assure consumers an adequate supply of colors and at the same time permit American manufacturers to go ahead, invest more capital, and build the industry up? It would seem so.

"Suggested plan of embargoing imports of dyestuffs," he says, with fine scorn. You, Reader, recall that plan perfectly. What? Oh, yes you *do!* It originated just at the time when the Senator was organizing his company to export ice cream to the Belgian Congo! Both ideas were eventually abandoned, but critics agreed that the Senator's scheme was a better business proposition than the other!

However, getting down to cases it becomes plain that Senator Moses means to "carry on" industriously to the best of his ability, of which ability this latest pronouncement may be taken as a fair sample. Seriously, that remark is as self-revealing an utterance as a man can make; it speak volumes for the desperate straits in which opponents of the Dye bill find themselves for material.

Let the lesson of the War Trade Board's report sink deep into the understanding of those who think our dye industry is ready to compete, unaided or "protected" by a mere tariff, with Germany; with Germany and her broken international credit, her policy of selling at a loss on government capital until all competitors not similarly subsidized are destroyed, and her enormous advantages in the way of economical production; and let it sink deep

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into the understanding of those who were misled by our own Department of Commerce's carelessly-worded and absurd statement that Germany will never again dominate United States color markets.

Only one measure will turn these roseate dreams into realities, and that is the Dye bill providing for the adoption of the licensing system. Japan found it so, France found it so, and after a harrowing experience England found it so. And a majority of the Senate likewise found it so, but were deterred from the performance of their plain duty by an organized handful depending for their right to hold the floor of the Senate day after day on such tommyrot as has just cluttered up the wire from Washington.

Once upon a time such abortive efforts to discredit the Dye bill were amusing, but we cannot longer afford to waste valuable days and weeks defending that which should need no defense. Now that inauguration is over, supporters of the Dye bill should make it their business to see that their rights and the rights of the nation are removed from vulgar political controversy. The War Trade Board report evidences the crying need for rapid, definite advancement on the part of our dye industry, and this cannot come while its ultimate fate at the hands of Congress remains the plaything of a few worshipers at the dismantled shrine of Kultur.

DYEING UNION MATERIAL

(Continued from page 9.)

the addition of common salt, or Glauber's salt. Very pleasing two-color effects can be produced by using one of the above colors. For example, if the dyebath is made up with Direct Fast Yellow and Acid Violet 6B and dyed in the following manner a very good combination of yellow and violet will be produced. Start the dyeing with the addition of Glauber's salt at a temperature of from 100 to 120 deg. Fahr. and raise slowly to the boil and boil for from fifteen to thirty minutes. Then shut off the steam and allow the goods to remain in the cooling bath for from fifteen to thirty minutes, after which they should be well rinsed and finished. There is no end to the number of color combinations that can be produced and I believe that if the dyer would try a few experiments with this class of goods he would be pleasantly surprised. Also, if the customer could see some of the results produced, she would take very quickly to this novelty dyeing.

The shades produced in this manner are as fast as the ordinary run of colors and will meet all normal requirements. Very solid shades can be produced on cotton and silk goods by using direct or union colors. The following direct colors work very well on cotton and silk goods: Direct Fast Yellow SB, Direct Fast Yellow FF, Chrysophenine, Direct Fast Yellow TZ, Direct Brilliant Flavine S, Direct Blue RS, Direct Brown M, Direct Brown GX, Direct Brown TC, Direct Brown 5R, Direct Green B, Direct Green G, Direct Violet N, Direct Violet BW, Direct Fast Red F, Direct Red 4B, Direct Red 10B, Direct Garnet, Direct Bordeaux, Direct Gray B, Direct Gray, Direct Black G, Direct Black GXOO and Direct Black RS. Most any of the Union Colors work well on cotton and silk goods and if these colors are used it is very easy to shade with either a direct or a wool color as the case may be. The dyeing should always be carried out according to the union dyeing method. Start the bath at a low temperature raise slowly to a boil, boil from fifteen to thirty minutes, shut off the steam, allow the goods to remain in the cooling bath for some time, rinse and finish.

Heather Mixtures

Heather mixtures have been in vogue for some time and are just as much in demand at the present time as ever. Most of the heather mixtures used in dress goods, suitings and coatings are composed of all wool and, needless to say, the effect is produced in the wool slubbing before the goods are made up. A good portion of the heather hosiery which we see on the market to-day is

composed of cotton and wool and the articles are colored after the hose have been knitted. Some very good effects are obtained by coloring the hose according to the regular one-bath method of dyeing. To produce the various two-color effects it is necessary to choose a neutral dyeing wool color for the wool and a neutral dyeing cotton color and then combine both these colors in the dyebath and carry out the dyeing as usual. The same rule that applies to heather effects on hosiery applies to union goods in general except that it is very difficult to obtain more than two colors on cloth while in the case of hosiery the stockings can be knitted with different fast color yarns with the white so that three or four different shades will appear on the finished hose while in reality only two distinct shades are produced. I have seen some very pretty two-color effects produced on union goods such as ladies' dress goods and suitings and I think that if the customer sometimes knew what novelties could be produced that the dye-house proprietor could build up considerable business along the different novelty lines—*National Cleaner & Dyer.*

According to Consul Caldwell, foreigners residing in Japan frequently purchase American silk socks and stockings, as they are cheaper and of better quality than the Japanese-made article. There is but one firm manufacturing silk hosiery in Kobe, the centers of silk manufacture being in Yokohama and Tokyo.

A. C. S. PROTESTS "GASSING" OF CHEMICAL WARFARE SERVICE

Vigorous protest against the reduction of the appropriation for the Chemical Warfare Service has been made by the American Chemical Society's Committee on National Policies.

Voting by telegraph, the committee has unanimously approved the following resolution, which was at once forwarded to members of the Senate and House of Representatives. The resolution was as follows:

"While in complete accord with the spirit prompting the restrictions of appropriations by the present Congress, nevertheless the American Chemical Society's Committee on National Policies would urge upon the Congress more favorable provision for the Chemical Warfare Service than is contemplated by the amount set by the House of Representatives—$1,500,000.

"The carefully prepared estimates of the officers of that service, slightly less than $4,500,000, represents less than one and a half per cent of the total appropriation for the army carried in the House bill. This amount is to care for the valuable property of the Government at Edgewood Arsenal, to enable the continuation of research on new lines of defense and offense, and to provide for the training of special troops and for the instruction of the entire army in all features of gas warfare.

"In view of the tremendous increase in the use of gases during the last year

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of the war, and of the fact that approximately 30 per cent of the casualties of our army in the war were due to gas wounds, we feel that the proposed reduction to one-third of the appropriation asked would so seriously cripple the development of the Chemical Warfare Service as to constitute a matter of grave national concern.

"We therefore urge that the Congress appropriate the original amount asked for the Service in the estimates submitted."

The American Chemical Society is composed of 15,500 members and has sixty sections throughout the country. Many of its members belong to the Chemical Warfare Service, either in the laboratory or in the field, and the Society has since the inception of the service been closely identified with it.

Commenting upon the resolution, Dr. Edgar F. Smith, president of the society and former provost of the University of Pennsylvania, has said:

"The Chemical Warfare Service will be effectively gassed by the proposed cut in the appropriations carried in the House bill.

"This Congress recognized the potentialities of chemistry in future warfare by creating this Service as a distinct unit of our army. Its efficient development necessitates extensive and prolonged research on problems of both defense and offense; a most valuable property, Edgewood Arsenal, is to be conserved and kept ready for immediate utilization and expansion if need arises; the army is to be instructed in gas warfare.

"Curtailment of these lines by the largely reduced appropriation proposed by the House of Representatives will surely cause delay which will require years to overcome and may mean future disaster."

Dr. Charles H. Herty, past president of the society and editor of the *Journal of Industrial & Engineering Chemistry*, on returning from an inspection of the Edgewood Arsenal, the headquarters of the Chemical Warfare Service, said that the great plant is being kept in first class condition and that research is in active progress, though the staff is still far too limited, considering the all-important character of the problems being attacked. He declared that both in preparedness for war and as a means of co-operating with the industries of peace the Chemical Warfare Service should be made to function on an efficient basis. The reduced appropriation, in his opinion, is totally inadequate for that purpose.

COLOR IN HOSIERY

Presiding at the Nottingham University College at a lecture by William Davis, M.A., on hosiery manufacture, the Hon. G. Hope Morley, of the firm of I. and R. Morley, Ltd., dealt with the subject of the dyeing industry. England, before the war, made less than 1,000 tons of pure dye. If one added to that the quantity of dyes made here from products imported, the total rose to 4,000 tons. To-day there was the nucleus of a magnificent industry, and England could produce something between twenty-five and thirty thousand tons, into which British capital and brains had been put. Prior to the war, the British capital in the industry was about £500,000; now it was £12,500,000. Surely a trade the importance of which could not be estimated was not going to be allowed to slip from our fingers. We must have legislation of some kind to protect the industry. There was one other factor that could very well be remedied. It seemed that the patents wanted revision. There were brains in England, but patents, where there were valuable inventions, were difficult, complicated, and expensive.

Mr. Davis said that the subject of color did not receive the attention of hosiery manufacturers commensurate with its importance as a vital factor in trade. Articles intended for underwear in particular were often uninteresting in their color effect, especially natural colored underwear, where the prevailing shades were dull and flat in appearance. In his opinion an effort should be made to brighten up many of those dull grays and fawns, where the

addition of a small percentage of bright primary hues blended in the wool would impart a touch of bloom to the article. The manufacturer should make a close study of the effect of color on the mind. For winter wear browns and reds, having a right, warm, and cozy effect, should be employed, whilst for summer wear cool shades of blue and green should predominate in the texture. Many were slow to appreciate the commercial advantages of being *au courant* with the prevailing shades of the new season. In some cases brown or gray would be the dominating factors, whilst in others lovat blends would prevail.

The colorist who catered for the export trade had to make a close study of the color taste of other countries. In design the French had distinctly floral tendencies, the Teutons were known for their love of strong and highly colored contrasts, whilst the markets of South America and the colonies had tastes peculiarly their own. To cater for those markets the colorist should spend some time in the different countries making a close study of their color predilections. In examining the goods displayed in many of our stores one could note numerous glaring defects in color taste, and one of the most common was lack of range and variety. Those responsible for the work did not make the most of the colors placed at their disposal, many permutations and possible combinations being entirely overlooked, owing to the haphazard manner in which the work was done. Strong vivid colors were found blended with mild tints, and there was often an entire lack of balance of the various color elements in the pattern. Little skill was shown in using colors, which, though not in themselves complementary, could be vastly improved by a judicious intermingling of black and white. In the clan tartan the most vivid and striking primary and secondary colors were successfully employed on a system of guarding the bright colors from impinging on each other by touches of black and white, whilst the large color diamonds were devised on a system which produced a harmonious whole.

In conclusion, the lecturer dealt with the problem of color blindness, and claimed that before entering on a career in which design and color were involved, the individual should have his vision tested for the defect. The color faculty usually developed during the teens, and the chief factors in the development were constant practice in handling and blending colors. The theory of color could do much to assist in educating the color taste, but much depended on the inherent taste of the individual.

THE USE OF GLUE IN WOOL DYEING

Better results are obtained in the scouring of wool where old baths are used rather than fresh ones, and attention is also drawn to the fact that a better penetration of color and a more uniform dyeing are obtained when wool is dyed in standing baths rather than in freshly prepared dye liquors. In order to explain these results, it has been suggested in the case of wool scouring that the potassium salts removed from the wool form a sort of soap with the grease also removed from the fibers, and thereby increasing the scouring efficiency of the bath. But under the conditions of scouring it is unlikely that any appreciable degree of saponification of this character takes place in the scouring liquors. Also the increased efficiency of standing dye baths has been explained by an increase in the concentration of the

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sodium sulphate or other salts used as assistants, which accumulate in the successive dye baths, but experiments conducted in order to test out this theory have shown that it is not a proper explanation.

Rinoldi considers that a more reasonable explanation of the various phenomena observed in connection with old baths in scouring and dyeing wool is to be found in a consideration of the material of the fiber itself, which, as it is well known, partakes of the nature of an albuminoid substance. It has been previously shown that wool is partially soluble in boiling water and, furthermore, shows a distinct loss of weight during dyeing, and consequently it has been suggested that the better results observed in the use of old dye baths and liquors are to be attributed entirely to the presence of a certain quantity of albuminoid substance in the dye bath originating from partial solution of the fibers.

There are also other facts which tend to confirm the presence of gummy substances in the dye liquor. For example, it was observed that wool could not be dyed as well by synthetic as by natural indigo when dyed under conditions suitable for the latter, and some of the indigo manufacturers recommend the addition of a solution of gum or glue in the preparation of the synthetic indigo vat for the dyeing of wool. Furthermore, in garment dyeing, previous to the dyeing of the material it was formerly cleaned by means of a treatment with soap and soda, a process which is liable to result in the shrinking of the woolen goods.

At the present time it is recommended that the garments be steeped in a warm solution of 4 to 5 per cent of glue without any other addition for a period of 24 hours, after which the grease, dirt and blue are removed by working well in water.

Rinoldi also puts forward the idea that the felting of wool is not only due to the interlocking of the external scales of the fibers but is also the result of the cementing together of the surfaces of the fibers, due to the fact that the wool fibers swell and become soft when treated with alkaline or acid solutions at high temperatures, then when tightly compressed they tend to adhere firmly together, the substance of the wool fibers becoming the adhesive substance.

By experiments on the cleansing of raw wool it was found that by the use of glue in the bath the wool loses less in weight and yields a softer and superior fiber than when soda is used. The baths are prepared with 1 to 2 parts of soap for every 2 to 3 parts of glue. It was also found from experiments in the dyeing of wool with various acid and mordant colors that the addition of glue to the dye bath acted as an equalizer and also assisted in the penetration of the color to a greater extent than Glauber's salt. —*Color Trade Journal.*

FUNCTIONS OF THE DYE CHEMIST

An Extract from the Address of B. Leech

Most dye works of importance now employ a chemist, but there is still room for very considerable progress in the direction of scientific organization and control of the processes carried on. On the one hand there is a deficiency in the supply of adequately trained men, and on the other there is a failure to appreciate the value of scientific control. The dyehouse chemist is to-day employed chiefly for the analysis and evaluation of materials as a guide to the buying department, but it is desirable that he should have a far greater share in management and responsibility, and that remuneration should be offered which would attract men who are fit to take such responsibility and have a place on the board of directors. It is not generally realized that a manager who possesses no scientific training cannot employ a trained man un-

der him in such a way as to get the greatest benefit from his services. Such a manager fails to see the opportunities for the application of scientific method which are actually under his eyes, and the problems which he passes on to the trained man are most frequently presented in a form which precludes any likelihood of the latter drawing up a report of real value. Given the trained man, the only way in which to bring him into contact with his work is to give him complete technical control and a free hand. It is often far easier to solve a technical problem than to explain it to a board of untrained directors and teach them to arrange the facts and draw the inferences in a scientific manner. However, the supply of men capable of taking responsibility is very restricted, and a much broader scientific education is needed in the technical school. When Nature presents a technical problem she has no regard for the examination syllabus. A problem which at the first glance appears to be a chemical one often involves a knowledge of physics of biology for its solution. The first requirement for the dyeworks chemist is a broad and thorough training in scientific method. In addition to chemistry he requires at least a sound knowledge of physics and mathematics, and he must be familiar with the technique of the microscope. The best training for such a man is a broad scientific course at a university, followed by special training in a technical school. At present the university-trained man knows too little of the technical side, and the technical college man knows too little of the scientific side. . . .

Advice of the trained man will be needed as to the plan and construction of buildings, the materials of the walls, roof, floor and drains, for wise decision on these points involves a knowledge of the processes for which the building is to be used. Ventilation (which is generally either very bad or immensely expensive), steam and power equipment, and the arrangements for artificial lighting also demand his attention.

Further, there is the important question of plant. The modern tendency is to dye all textile materials at as late a stage of manufacture as possible. If goods can be woven "in the gray" and dyed in the piece the output of a given number of looms is far greater, and there is much less risk of damage than if they are woven from dyed yarns. But piece-dyeing involves a great variety of machinery, and almost every one of the new fabrics which have appeared in recent years requires special machinery for dyeing and finishing. The problems involved in devising means of dyeing expeditiously a new fabric, having regard to the choice of dyestuffs and contents and temperature of the dye-liquor to which one is restricted, and the final finish which the fabric is required to have, are such as require an intimate knowledge of the properties of the dyestuffs under very varied conditions, as well as of the physical properties of the fabric and of the materials which can be used in constructing the special machinery. In this connection it may be remarked that the most conspicuous successes have only been attained when the designer of the cloth and the dyer have worked in close collaboration.

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Dye-a-Grams

This column doesn't care whether a shade is a color, or a color a shade, or a tint a hue or vice versa. What we are most in need of now is the types we are short of—technicalities may come later!

—o—

Speaking about shades, tints, hues and colors—one thing we all gotta hand Newport: They had *the* "tone" at the Chemical Show!—eh, Mr. Low?

—o—

A reason why some men don't stay long in one place is that they don't take enough interest in their work, or if they do, they take too much, and the "interest" they take affects the "principal"!

—o—

We don't blame anyone for talking about the weather these days. It's that kind of weather!

—o—

Legislators throughout the country are introducing freak bills. If they'd stop this introducing stuff and get acquainted with the Longworth bill, we'd say the country was *really* getting "back to normalcy."

—o—

Speaking of Exchange as it exists between Canada and the U. S.—properly speaking, it is Robbery!

—o—

In nearly all parts of the country textile mills are trying to find some means of making the cotton they mix with wool look "sheepish"!

—o—

Judging by the success of "Mr. Ponzi," Boston may rightly be designated as the "Great Fish Center."

—o—

"Mellon Groomed for Cabinet Plum" —*headline*. And without any Luther Burbank grafting, either!

—o—

We recently read where General Bliss would encourage disarmament. Well that's easy; disarmament would encourage general bliss!

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NOTES OF THE TRADE

The Lion Knitting Mills Company, Cleveland, Ohio, is operating plant at 3256 West Twenty-fifth Street equipped with seventy-one knitting machines and forty-eight sewing machines, making hosiery for men, women and children. The capital of the company is $100,000. H. V. Ensten is president and L. H. Ensten is treasurer.

———

The Council of Swiss Chemists has been formed by the Swiss Chemists Society, the Swiss Society for the Chemical Industry and the Swiss Union of Analytical Chemists. The president of the new council is Dr. P. A. Guye, the vice-president Dr. A. Landolt and the secretary Dr. W. G. Baragiola. The purpose of the Council is to pass on all questions which are of general interest to Swiss chemistry and to represent Switzerland in the new International Union of Pure and Applied Chemistry.

———

The du Pont Chemical Company, Deep Water Point, near Carney's Point, N. J., is planning for the construction of a pipe line from Plant No. 2, at its former powder works, to its new dye plant. The line is to insure a suitable water supply for dye manufacture; it will be about two miles in length and is estimated to cost about $200,000, including a new filter plant to be constructed. The source of water supply is Layton's Lake. The company constructed a pipe line to its powder works during the war period.

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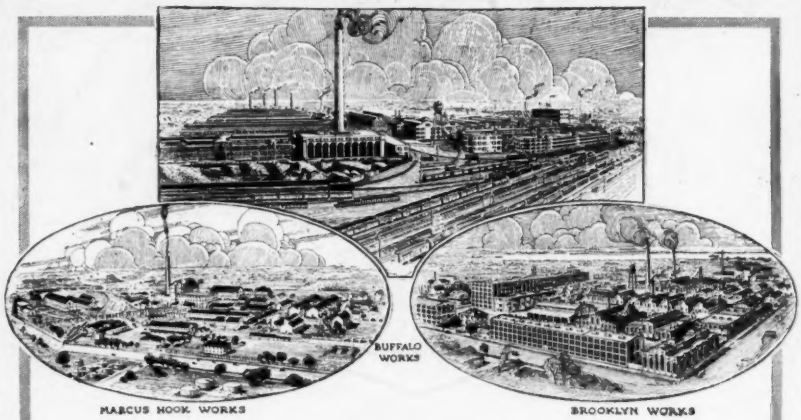

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